

REPORT ON THE ANALYSES OF TEXTILES UNCOVERED AT THE ANCIENT IRAQI SITE: PART 4

Fibers & Textiles Laboratories,
TORAY Industries, Inc.*

Given below are the results of morphological analyses attempted by us on the textiles found at at-Tar Caves. The English was kindly improved by Mrs. Maya Ikuma.

Summary

Textiles coming from at-Tar Caves:

Fiber analyses (No. 33–No. 48)

- A. In view of the fiber surface structure and cross sectional structure, it has been proved that all the samples are composed of beast fibers which belong to animal fibers. The fibers which have great resemblance to sheep fibers, one of today's typical beast fibers, are used there.
- B. The samples treated here are nearly the same in fiber thickness, unlike the other sheep fibers from at-Tar Caves that have ever been analysed. The sample numbers follow those in the report that appeared in *Al-Rāfidān* Vol. XI [Fibers & Textiles Laboratories, Toray Industries, Inc., 1990, p. 70, Table 1], Vol. XII [Fibers & Textiles Laboratories, Toray Industries, Inc., 1991, p. 164, Table 1], and Vol. XIV [Fibers & Textiles Laboratories, Toray Industries, Inc., 1993, p. 150, Table 1].

Analytical details

Methods

- A. **Pretreatment:** The textiles were treated with ultrasonic wave washing while immersed in water, since their fiber surfaces were found soiled by lots of mud or the like.
- B. **Observation of the fiber surface structure:** The textiles were observed by using the scanning electron microscope after Au-Pd shadowing had been applied to their fiber surfaces.
- C. **Observation of the cross sectional structure:** The optical microscope observation was carried out on a section of 6 μm in thickness each into which the samples were cut by Minot's microtome after embedding them in paraffin.
- D. **Elementary analyses:** Each sample was left to the analyses by means of scanning electron microscope and X-ray microanalyzer after its carbon shadowing.

Observations and consideration

Material analyses

Pls. 1–4 show the results of photo-observation of the samples' fiber surface structures and cross sectional structures. And Table 1 indicates the results of their morphological analyses.

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Excepting one stitch thread, all the samples are judged to be of sheep fibers, seen from their fiber surface structures, cross sectional structures and fiber widths.

Table 1 Analytical Results of Beast Fibers of the Non-Pile Textiles: Cave 16, Hill C

Sample No.	Description				Material Beast fiber	Fiber width (μm)
	Textile No.	Specimen No.	Kind	Color of outward appearance		
33	T-20	V-2-3	Selvage warp	Dark grayish brown	Sheep	15-40
34	T-20	V-2-3	Selvage weft	Dull reddish yellow	Sheep	15-30
35	T-20	V-2-3	Ground warp	Dark grayish brown	Sheep	20-35
36	T-20	V-2-3	Ground weft	Dull reddish yellow	Sheep	~25~
37	T-21	V-86-1	Warp	Dull reddish yellow	Sheep	20-50
38	T-21	V-86-1	Pattern weft	Deep yellowish red	Sheep	18-50
39	T-24	V-107-4	Warp	Dull reddish yellow	Sheep	15-40
40	T-24	V-101-6	Stitch thread	Dark brown	Normal goat	70-100
41	T-25	IV-W-8-⑥	Ground Weft	Brownish gold	Sheep	15-35
42	T-35-2	V-126-2a	Sewing thread	Dark brown	Sheep	20-40
43	T-36	IV-W-32-3	Warp	Dull reddish yellow	Sheep	15-30
44	T-36	IV-W-32-3	Ground weft	Dark reddish brown	Sheep	15-35
45	T-38	V-21-13	Pattern weft	Deep purplish red	Sheep	15-30
46	T-40	V-73-2	Warp	Dark reddish brown	Sheep	15-40
47	T-42	IV-W-53	Warp	Dark blue	Sheep	20-40
48	T-42	V-41-15	Pattern weft	Deep red	Sheep	20-45

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Pl. 1

Longitudinal view

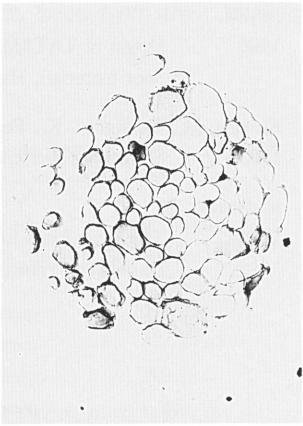
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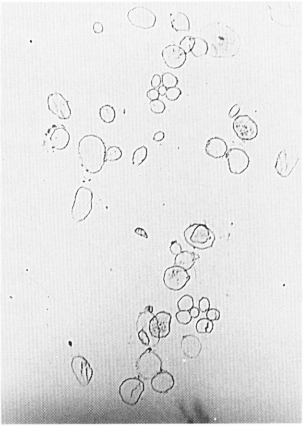
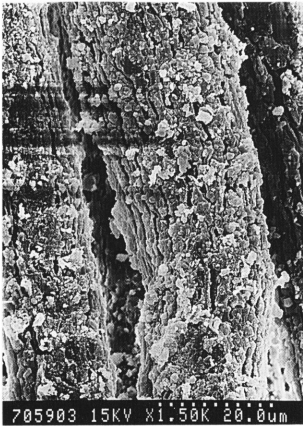
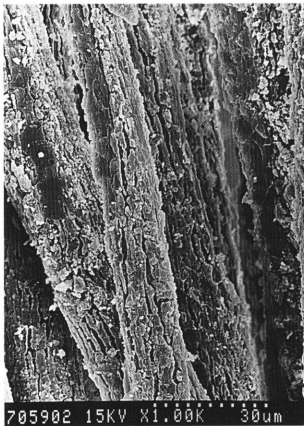
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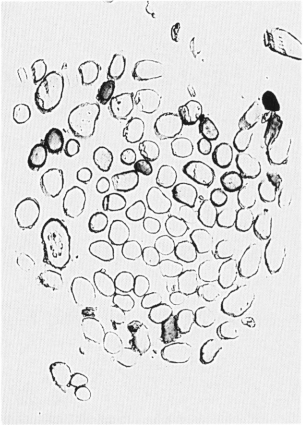
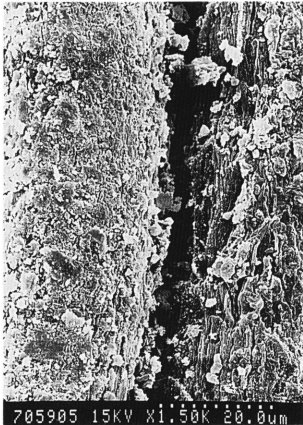
Sample No. 33
(Dark grayish brown)
Sheep fiber, selvage warp.



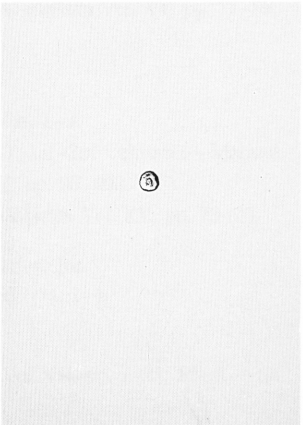
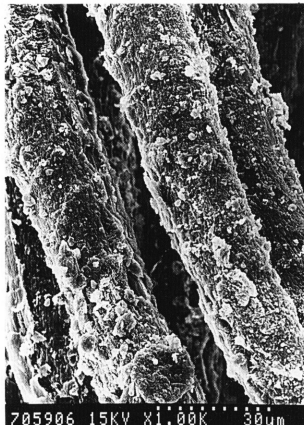
Sample No. 34
(Dull reddish yellow)
Sheep fiber, selvage weft.



Sample No. 35
(Dark grayish brown)
Sheep fiber, ground warp.



Sample No. 36
(Dull reddish yellow)
Sheep fiber, ground weft.



Samples 33, 34, 35 and 36

Longitudinal view

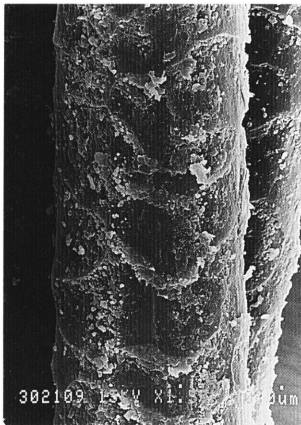
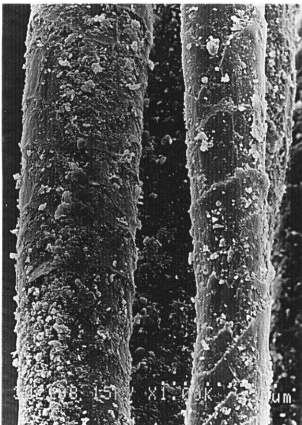
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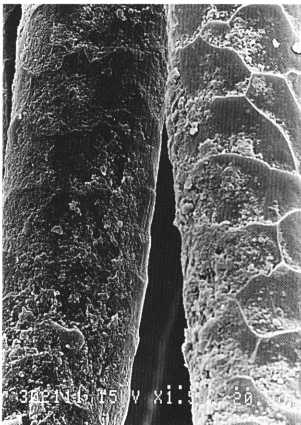
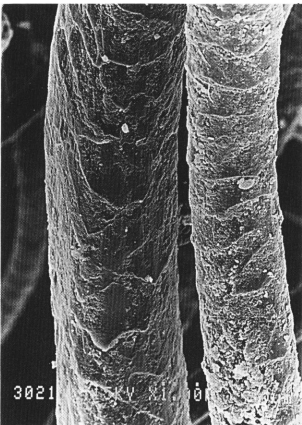
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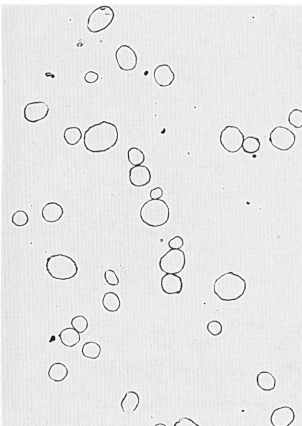
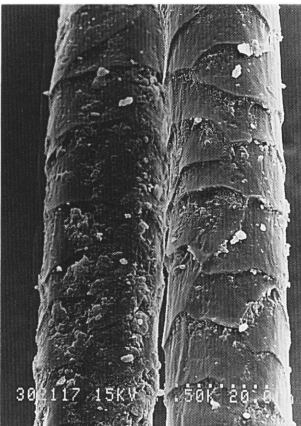
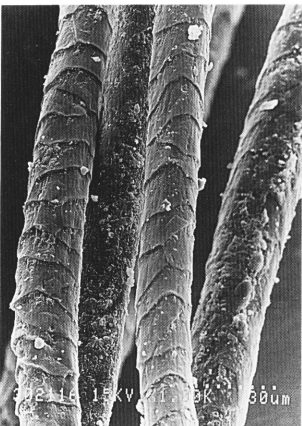
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Sheep fiber, warp.



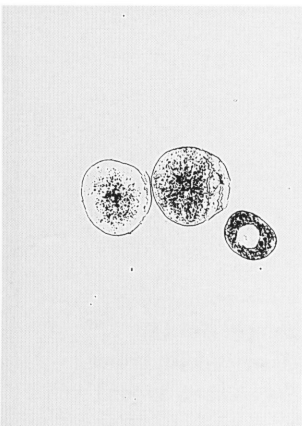
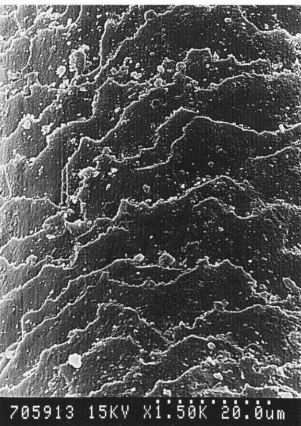
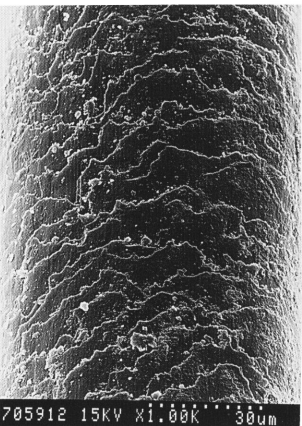
Sample No. 38
(Deep yellowish red)
Sheep fiber, pattern weft.



Sample No. 39
(Dull reddish yellow)
Sheep fiber, warp.



Sample No. 40
(Dark brown)
Normal goat, stitch thread.



Longitudinal view

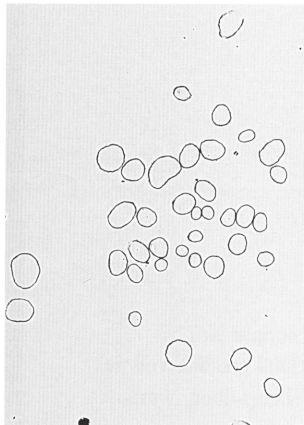
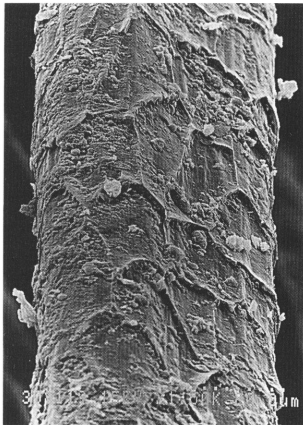
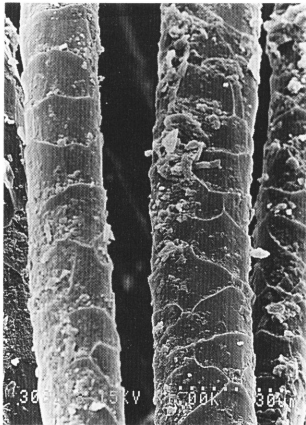
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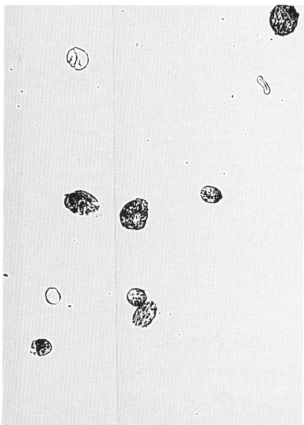
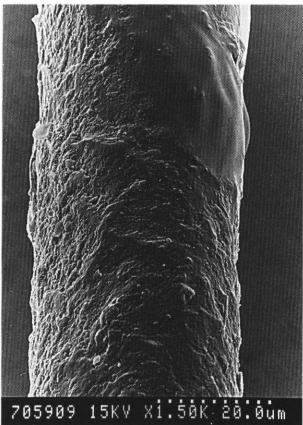
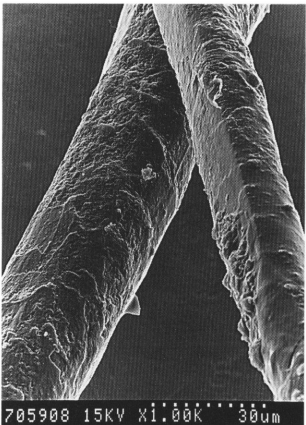
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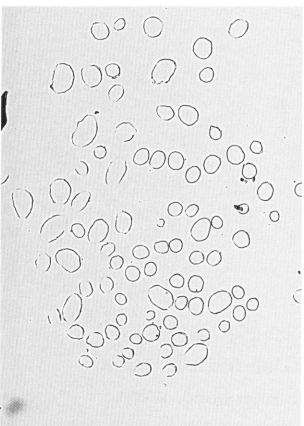
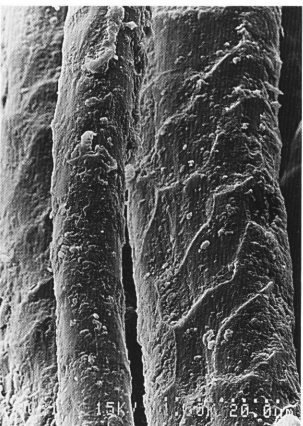
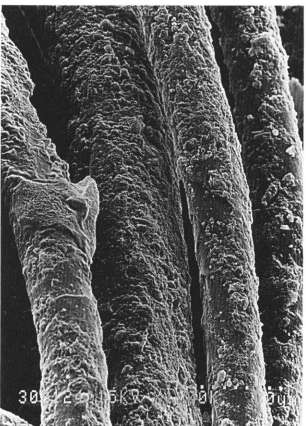
Sample No. 41
(Brownish gold)
Sheep fiber, ground weft.



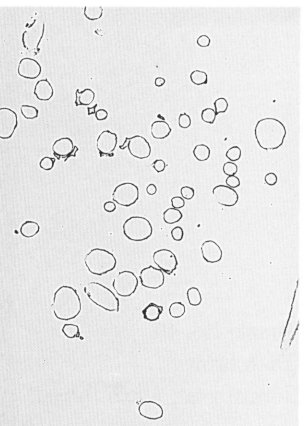
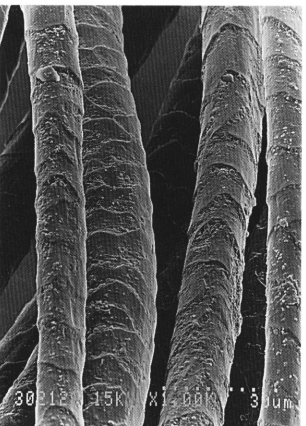
Sample No. 42
(Dark brown)
Sheep fiber, sewing thread.



Sample No. 43
(Dull reddish yellow)
Sheep fiber, warp.



Sample No. 44
(Dark reddish brown)
Sheep fiber, ground weft.



Samples 41, 42, 43 and 44

Longitudinal view

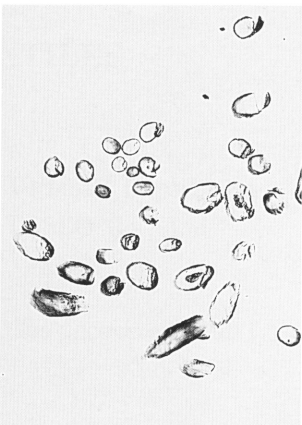
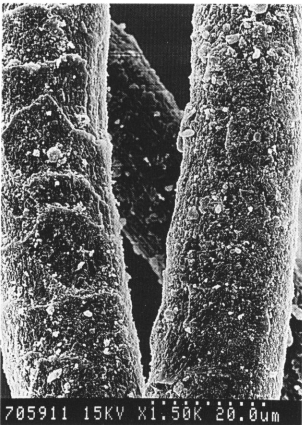
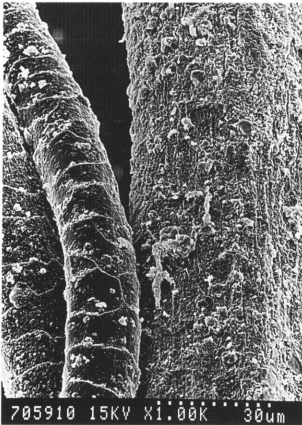
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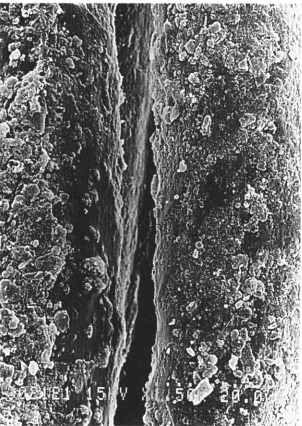
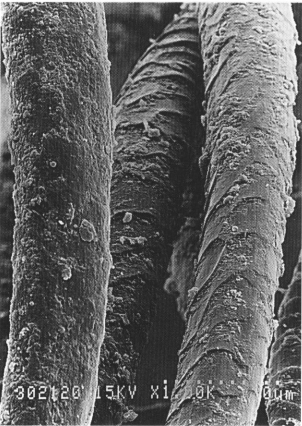
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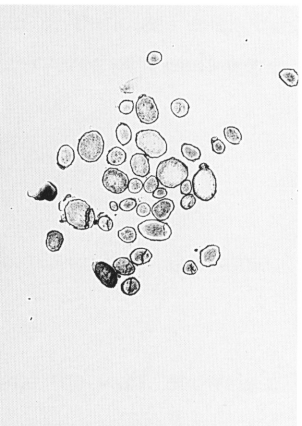
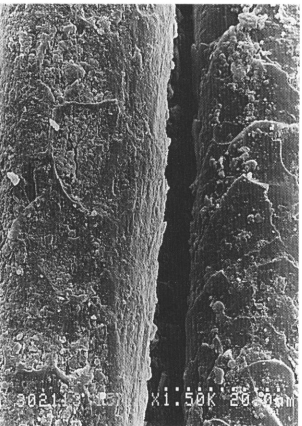
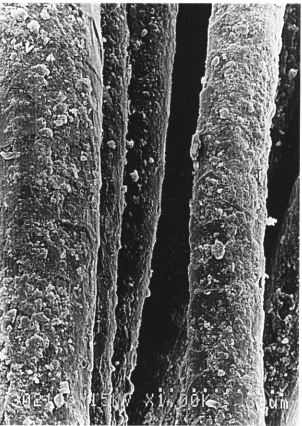
Sample No. 45
(Deep purplish red)
Sheep fiber, pattern weft.



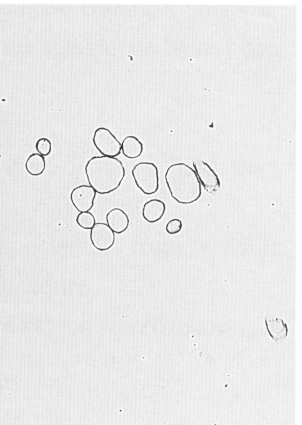
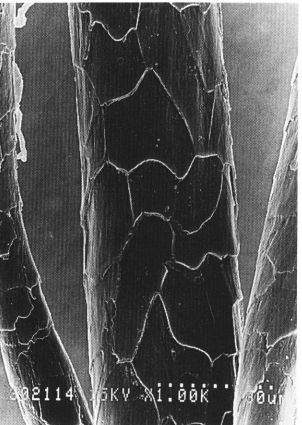
Sample No. 46
(Dark reddish brown)
Sheep fiber, warp.



Sample No. 47
(Dark blue)
Sheep fiber, warp.



Sample No. 48
(Deep red)
Sheep fiber, pattern weft.



Samples 45, 46, 47 and 48